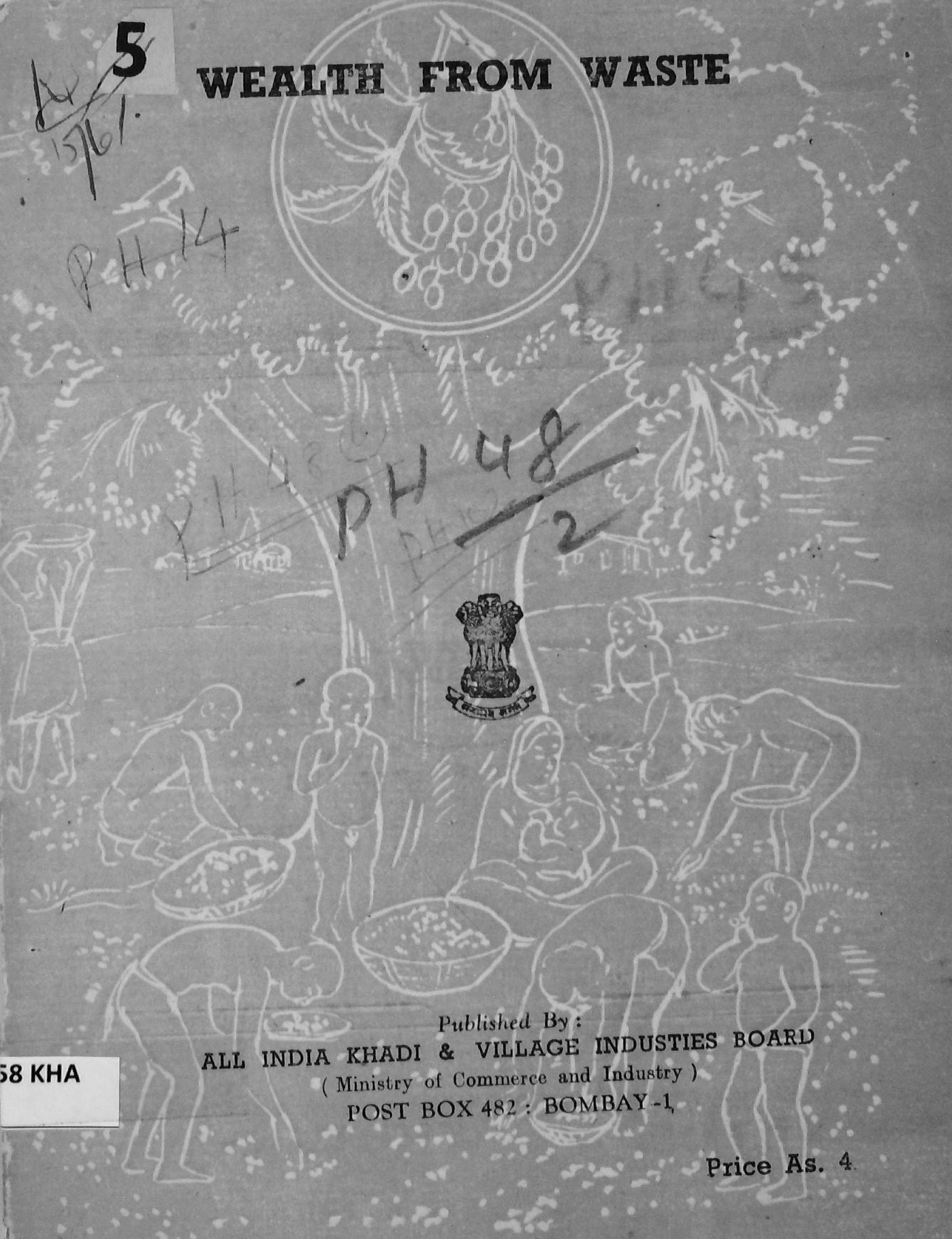
5 WEALTH FROM WASTE



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WEALTH FROM [illegible]E

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India is one of the most important producers of oilseeds in the world. The total production is about 5 million tons annually. Most of these seeds are crushed to produce vegetable oils. In 1952/53 the total oil production in the country amounted to 11,54,000 tons. In addition, a quantity of 1,14,000 tons of coconut oil was also produced. Oil available for edible purposes does not exceed 1.1 million tons. On this basis, the average per capita consumption works out to less than 0.35 ounce per day. This is utterly inadequate from nutrition standards. Nutrition experts have prescribed a minimum per capita consumption of 2 ounces of fats per day.

It is, therefore, evident that it is necessary to conserve as much of the edible oils as possible for nutritional purposes. This can be done if the crushing of edible oils now used for industrial purposes is minimised and in their place non-edible oils are progressively introduced.

RAW MATERIALS

India abounds in a variety of non-edible oil seeds which could be crushed and the resultant oil progressively utilised for industrial purposes. Today, a major portion of these seeds is wasted. No arrangements exist for the maximum collection of these seeds which lie scattered in all parts of the country. The collection and utilisation of these seeds should add considerably to the oil resources of the country. This will also help in developing a new type of cottage industry with a substantial employment potential.

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The more important varieties of oil-bearing seeds which are found in India are:-

Neem, Maroti, Karanja, Dhupa, Pulang, Castor and Undi, etc. All of them yield oils of industrial and medicinal value. At present, the production of Karanja and Neem oils is about 3,000 tons and the total production of all miscellaneous oils of this class is about 25,000 tons.

Industrial uses of oils come under the following three categories:-

Category	Quantity
Soap-making	70,000 tons.
Paints manufacture	30,000 tons.
Lubricants	25,000 tons.

Thus 1,25,000 tons of edible oils go into non-edible uses. Much of this could be saved for nutritive uses for the people.

Trees producing these oil-bearing seeds are widely scattered in forests and in uncultivated waste lands. A recent survey in the Madras State has shown that 72,700 tons of Neem seeds alone could be collected in the State. Actually, however, only 20,000 tons are collected and crushed, yielding 1,600 tons of Neem oil. If effieiently organised, Madras alone could produce about 10,905 tons of Neem Oil per year. The position in other States is not different. In Orissa only about 10% of the Neem seeds is collected and crushed, while in Madhya Pradesh it is a bare 11%.

Karanja seeds are obtained from Karanja trees which grow naturally in forests in Orissa, Mysore, Hyderabad, U. P. and Madras. Madras State alone is said to have 36 lakhs of these trees. The average yield of kernels per tree is 50 lbs. with an oil content of 35%. According to the Indian Central

Oil Seeds Committee the total Karanja seeds collection in this State is only 5,170 tons per annum. As in the case of Neem seeds most of these seeds are also allowed to go waste.

The Karanja oil is used at present for tanning of leather and moulding purposes. A small quantity is also used for lubrication purposes. Today the leather industry consumes on an average 1,525 tons of Karanja oil. As the Board's Programme for the development of Village Leather Industry expands, there will naturally be a great demand for this oil for processing hides.

POTENTIALITIES

Full utilisation of all the available Neem and Karanja seeds can give fuller employment to a very large number of people engaged in the collection of seeds.

Though no reliable data is available about the exact quantity of the availability of non-edible oil seeds in the country, an approximate idea can be had on the basis of the data available for certain States. Calculated on this assumption, the non-edible oilseed wealth of the country can be guaged from the following table :-

Total quantity of seeds available :	10,00,000 tons.
Total quantity of oil produced at present.	26,000 tons.
Total oil production potential	1,50,000 tons.
Value of oil potential in rupees	15 crores.
Total soap production potential	50 crores lbs.
Total value of soap in rupees	25 crores.

* Collection of seeds is a seasonal occupation and lasts only about two months. Employment, therefore, is also seasonal. It is calculated that some 12,00,000 persons will be required to gather the maximum quantity of seeds.

Calculated on the basis of man-days, in seeds collection alone some 2,00,000 persons will get full-time employment. In addition, nearly 1,00,000 persons will be employed in oil pressing and in the manufacture of soap when the resources available are fully utilised. The employment potential that this industry holds forth, is :

In collection of seeds	2,00,000 persons.
In oil pressing	60,000 persons.
In soap-making	30,000 persons.

WAGE DISTRIBUTION

In collection of seeds at Rs. 2 per md.	Rs. 5,60,000
In oil pressing at Rs. 2-8-0 per day	Rs. 4,50,000
In soap-making at Rs. 3-0-0 per day	Rs. 2,70,000

Besides wages, other expenses are incurred. These include maintenance of the bullocks, the ghanis and other sundries. Providing for these, the margin left as profit will be very limited.

The figures given are on the basis of minimum wages. When fully developed, the non-edible oil industry is capable of releasing 1,50,000 tons of edible oils from their present non-edible uses. It is a substantial addition for nutritional purposes. To the present consumption of the people about 10% more oil will be available.

The employment figures have been calculated on the basis, that, when fully developed, there would be established 3,000 soap making centres in the country. Each soap-making centre, it is calculated, will require 50 tons of oils and will employ 10 persons. Each centre will be served by seven oil pressing centres, each employing 3 persons. A smaller soap-making unit can be started with four ghanis. This is what the Board has proposed. Wages are calculated

at Rs. 2/- to Rs. 3/- per day of 8 hours and 300 working days in the year.

It will thus be seen that the wasted oil resources of the country can, if recovered, release substantial quanties of edible oils from their non-edible uses and made available for the consumption of the people. Non-edible oils can be used for the manufacture of soap.

PROGRAMME

The All India Khadi and Village Industries Board, therefore, has undertaken the development of the soap-making industry with non-edible oils and has framed its programme for this purpose. The scheme is divided into two parts:-

(1) Model Centres run by the Board directly, and

(2) Centres run by approved institutions with the assistance of the Board.

The Model Centres will lay down certain standards of efficiency and demonstrate the economics of this industry. The assistance envisaged is monetary and will be given partly by way of grants-in-aid and partly through loans.

A proposal has also been made for the grant of a subsidy of one anna per seer of neem oil produced by those centres as an incentive for vigorous efforts in the direction of collection of seeds.

It is possible that all the oils pressed may not be used in soap-making alone. Marketing of the surplus oils will have to be undertaken and for this purpose the Board has proposed that a sum of Rs. 1,00,000 may be placed at its disposal.

Soap-making with non-edible oils is a new village industry. It is necessary, therefore, that those engaged in the industry should have adequate knowledge of the techniques and processess. Arrangements are under way for training

candidates in the industry. The training period will be of 3 months' duration and those who desire to undergo the training will be given a stipend of Rs. 40/- to Rs. 50/- per month. While the programme is in process of implementation, steps have to be taken for a proper survey of the availability of non-edible oil seeds in various areas.

NEED FOR SURVEYS

Producer Co-operatives, popular institutions, Village Panchayats etc. which are interested in the development of this industry can help in making these surveys in their respective areas. They can, thereafter, intimate to the Board, through the Secretary of their State Boards, their willingness to start non-edible oil crushing and soap-making centres. The help that can be expected of the Board is of the following nature :—

	Grants	5-year loan	Working capital.
	Rs.	Rs.	Rs.
Oil pressing			
(1) 50% grant and 50% loan on the following non-recurring expenditure :-			
Shed for Ghanis : 2,000			
Two Ghanis 600			
One Chakki 600			
Three Bullocks 1,200			
4409			

	Grants	5 year loan	Working capital.
	Rs.	Rs.	Rs.
Other equipment 1,600			
Rs. 6,000 X 4 centres Rs. 24,000	12,000	12,000	—
(2) Loan for working capital :- 3,000 X 4 = 12,000			12,000
Soap-Making			
(1) 50% grant and 50% loan on the following non-recurring expenditure :- Equipment 5,000 One shed 5,000 One well 1,000 Miscellaneous 500 11.500	5,750	5,750	
(2) Loan for working capital			8,000
(3) Salary of supervisor-cum chemist at Rs. 150/- p. m.	1,800		
	21,150	17.750	20,000

In other words, a soap-making centre with 4 oil pressing units will be provided with one shed, one well, office buildings, five kadais, two tanks for storage of refined non-edible oil, wooden soap frames, one tank for dissolving caustic soda, five drums, one beam weighing scale, one soap cutting table, one stone shaping machine and dies, four hearths and chimneys, hand stirrers, gloves, hammers, chissels, shovels etc. A provision will be made for a supervisor-cum-chemist for each centre.

All these requirements for a small model soap-making centre are calculated to cost Rs. 1,600. But they may cost less for an average centre. A beginning can be made on a small scale. One full centre visualises a collection of neem seeds of about 6,000 to 7,000 bags. One full centre can be conveniently divided into 4 of these smaller centres. Each of these smaller centres will need about 1,600 bags of seeds and will be served by two oil ghanis. A soap-making centre of this type will produce about 200 lbs. of good soap per day. Such a small unit may have to incur a recurring and non-recurring and running capital of about Rs. 15,000. Meeting all other charges, this soap can be sold at 8 annas per lb. which is a competitive price.

The average per capita soap consumption in the country is at present computed at 1 lb. per year. Development of the non-edible oil soap-making industry in the villages on the smallest units, as stated here, will make available 3 lbs. of soap per capita per year.

YOU CAN MAKE IT

We have seen the potentialities of soap-making with Neem or non-edible oils and what a substantial contribution it can make to the national economy when available raw materials are fully utilized. Let us now consider how this soap is made. Neem oil, when pressed out of the seeds, is deeply coloured and has a strong odour. Besides, it contains many impurities. Thus the freshly pressed out oil cannot directly be brought into the making of the soap. First of all the impurities have to be strained or filtered out. The filtered oil is poured into drums and stored.

How is soap made out of this oil? There are a few simple processes before it is converted into soap of the kind one needs. In these processes, the first is to eliminate the deep colour of the oil and then to deodourise it. This is done as shown below:

Process No. 1

Pour the strained oil into a pan and boil well.

When boiling add a solution of salt water to the boiling oil. The salt water solution should be half the weight of the oil taken for boiling. Salt is dissolved in water twice the weight of the salt.

Mix and stir the boiling mixture of oil and salt water solution with a long iron rod. Stir constantly.

When 50 per cent of the water has evaporated, take out the remaining mixture and allow it to cool.

After some time the oil comes on top of the water in the mixture. Slowly separate the oil from the water.

The separated oil is filtered before filling in containers. This oil is only partially purified.

Process No. 2

Keep the oven ready for cooking the purified oil.

Place a large-sized pan over the oven. Pour 100 lbs. of the purified oil in the pan.

As the oil gets heated, prepare a solution with 14 lbs of caustic soda. The density of the solution should be about 10 to 15 per cent.

Mix this solution slowly to the oil on the oven, stirring it briskly all the time with a long iron rod. The same rod may be used as in the previous process.

When the caustic soda solution has completely been mixed with the oil, soponification begins.

At this stage add 2 to 3 lbs of common salt. When this is done a black liquid comes out of the soap formation. When the soap part is completely freed of this solution, separate the soap from the solution.

This soap is now almost free from the odours and impurities and the deep colour of the oil. It is called "grained soap."

Process No. 3

The "grained soap" is left over for the day to settle.

It is then subjected to the same process as in No. 2. This is done the next day. If smaller quantities of soap are to be made both the processes, No. 2 and No. 3, may be carried out the same day.

During this process, too, some black odourous solution comes out.

This solution is separated and thrown away.

Process No. 4

The "grained soap" is now ready to be converted into toilet, household or washing soap. Free of all

impurities and odours, the resultant soap is pure and as good as any other with the added medicinal properties of Neem which make it a better and a cheaper soap.

*How these three kinds of soaps are made is shown below:

Raw Material	Toilet Soap.	Household soap	Washing soap
"Grained Soap"	80 lbs.	80 lbs.	80 lbs,
Coconut oil	20 ,,	20 ,,	20lbs*
Mahuva oil	30 ,,	25 ,,	25 ,,
Rajan (Rosin)	Nil	5 ,,	5 ,,
Caustic Sol 30°B	30 ,,	30 ,,	30 ,,
Silicate of Soda 35°B	5 ,,	15 ,,	15 ,,
Kraslic Acid	4 ,,	Nil	Nil
Perfume	Nil	12 oz.	16 oz.

Colour: According to taste. No colour is added to washing soap which when treated as above comes out as yellow washing soap like any other washing soap.

*The formula given above is what is generally followed by Neem Soap manufacturers. It will be noticed that 25 per cent edible oil is used in the manufacture. This reduces the availability of coconut oil for edible purposes. In India, where supply of edible fats fall far short of the nutritional requirements of the people, so much coconut oil which goes into the manufacture of soap has to be saved for the food of the people. Experiments conducted by the All India Khadi and Village Industries Board at the Kora Gramodyog Experimental Centre near Bombay, have shown that coconut oil can effectively be substituted by other suitable non-edible oils.

Care has to be taken in mixing the ingredients shown in the formula above. This is done as follows :

1. The grained soap is poured into a pan.
2. First the solution of Caustic soda is added and mixed properly.
3. If Toilet Soap is intended, Rajan (Rosin) is not used. The mahuva oil is mixed.
4. In the case of other soaps, Rajan (Rosin) is mixed first and then the Mabuva.
5. After mixing as above, the pan is heated with the contents. When the mixture begins to boil, mix Silicate of Soda.
6. At 60^0 to 70^0 boiling, mix the rest of the oil kept separately.
7. At this point the whole mixture in the pan begins to solidify into soap.

Process No. 5

When the soap is completely mixed the desirable colour and Kraslic acid are added. Then the desired perfume is also added. When all these are done, the mixture becomes integrated and all traces of caustic soda disappears. Then this prepared soap is allowed to cool in iron moulds. The temperature is taken at below 60^0 or 70^0. When the soap is cooled it is cut into cubes or bars of desired sizes and pressed. When these processes are all complete about 170 lbs. of soap are obtained.

The process described here is known as the "grained" process. There are other ways of making soap as well. But the popular, easier and economic way is the "grained" process.

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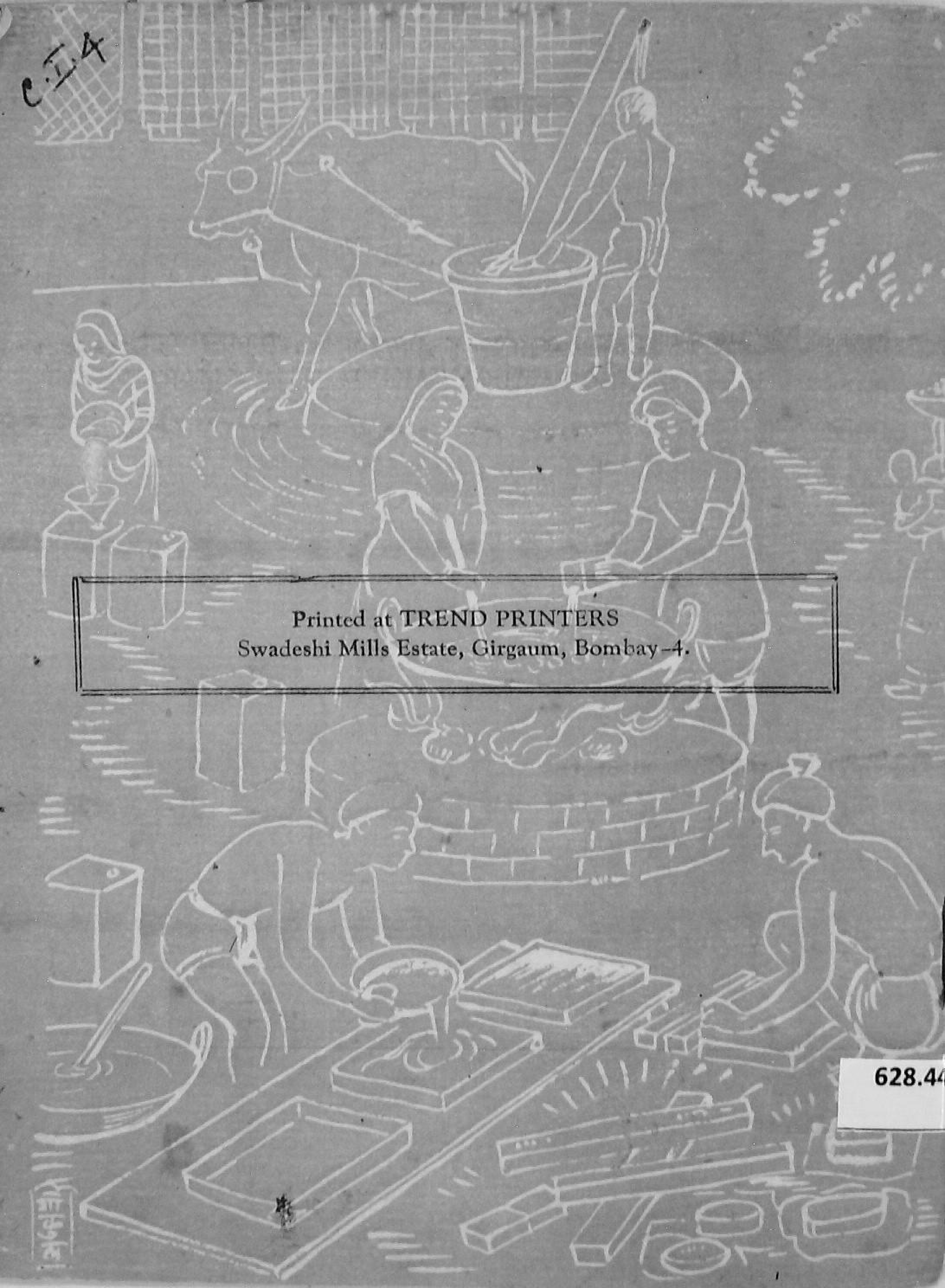

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